

## **Early Days at Bradford and York**

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Archaeometry first entered my consciousness when I was a student at Cambridge. I remember Professor Sir Graham Clark, the Disney Professor of Archaeology, collaring me one day and, in the way that professors do, making me an offer I couldn't refuse. He wanted me to go out with a pair of boffins from Oxford to try out a proton magnetometer on a chalkland Iron Age site at Barley in Hertfordshire. The boffins turned out to be Dr Martin Aitken and Professor Teddy (later Sir Edward) Hall, both to become in due course household names in the world of archaeological science. The proton magnetometer turned out to be a heath robinson contraption in the earliest stages of experimental development; and my most vivid memory of the day was the frequent intervention of nearby electric trains, the fluctuating fields from which threatened to vitiate the entire experiment. My next most vivid memory was of sinking beers with Martin and Teddy in the local pub as they puzzled over what was happening.

I mention the experience because it led me, though completely scientifically illiterate, as arts-based students could be in those days, to start taking an interest in geophysical prospecting. Martin invited me to come to his archaeometry conferences. I remember meeting there other early practitioners, Richard Linington for example, who went off in due course to do pioneer work at the Lerici Foundation, and the young - well, youngish - Arnold Aspinall. I was mildly pleased to find he was another Northerner, albeit a Lancastrian; mildly surprised to find such work going on at what I had always known as Bradford Tech., where my civil engineer brother had done his engineering training; and mildly charmed by Arnold's whimsical and downbeat attitude to the enthusiasms of the Oxford establishment.

I soon found the science at archaeometry conferences completely beyond me and ceased to go, though, perhaps unusually amongst then-active field archaeologists, I became ever-more enthusiastic about field applications. I remember dragging the then very young Mike Tite from Oxford to an island fastness in the middle of Lough Neagh in Ulster to prospect for medieval iron working sites during my first job in Martyn Jope's Archaeology Department at the University of Belfast. Five years on and magnetometry also helped in the search for medieval pottery kilns in Hampshire when I transferred to the University of Southampton, where Anthony Clark was doing his post-graduate resistivity research. It was all very far away, of course, from Bradford, where Arnold's work was quietly progressing.

We came together again, however, in 1972 when I moved to York to set up the York Archaeological Trust. The Trust saw as its task the comprehensive investigation of the

deeply-stratified and vast multi-period archaeological site that was the City of York. The idea was to deploy the best available techniques and the most up-to-date methods to take urban archaeology on from the plateau of excellence achieved during the 1960s by the Biddle campaigns at Winchester. It was to be done, however, entirely within the opportunities provided by urban redevelopment.

This was at the end of the 'white heat of technology' era which had transformed Bradford Tech into a University - it celebrated its 40<sup>th</sup> anniversary only a few weeks ago - and at the beginning of the 'white heat of rescue archaeology'. In the general ferment over rescue archaeology at the time everyone expected that geophysical prospecting would have a vital role to play in identifying sites before the destruction that seemed to be their increasingly inevitable fate. I certainly thought it would in the York mission, and I knew where to find the expertise. Arnold was still at Bradford, and was one of the resources I had identified when designing the York Archaeological Trust's programme, so I turned up on his doorstep.

I seem to remember Arnold pouring the same kind of cold water over my enthusiasm for him to work on deeply-stratified city centre sites in York as he had sloshed over the Oxford boffins long ago. His lost middle initial, as all his friends know, is C; C for Cautious. Arnold Cautious Aspinall repeatedly reminded me how difficult it would be to resolve data from multi-layer and multi-period sites, whether by resistivity or magnetometry; and how difficult magnetometry would be in a built-up urban environment. The electric trains of Barley kept flashing past in my mind's eye.

However, I give it to Arnold, he did try. On rare open sites in the city he was able to produce useful and usable results. I seem to remember, for example, surveys demonstrating massive underground features streaking across the wide open spaces of the Museum Gardens around St Mary's Abbey. These were years, however, when geophysical prospectors preferred to pick off plumbs on perfect thinly-stratified open sites with highly susceptible subsoils, where reputations could rapidly be made: places like Thwing over in East Yorkshire. Even before the days of the research assessment exercises hard graft for ambiguous results in the complicated and soggy clays of York hardly seemed worth the effort.

Renewed contact with Arnold, therefore, did not produce the immediate dividends for York for which I had hoped but it rapidly produced dividends of another and rather less-expected sort.

By 1972 Bradford already had ten years of experience of work on the application of nuclear physics to archaeological problems. From 1962 onwards a research group in Physics under the leadership of Dr (later Professor) Gordon Brown, including Arnold Aspinall, had been using nuclear methods of analysis in the study of archaeological ceramics and lithics. This work, together with Arnold's ongoing geophysics research, brought the University a growing reputation as a centre for archaeological science, a burgeoning publication record and extensive contacts outside the University.

One such contact was Leo Biek, the charismatic Scientific Officer to the Inspectorate of Ancient Monuments, who was always on the lookout for ways of involving scientific specialists in the nation's field archaeology problems. He rapidly recognised possible synergies between the work of the Bradford archaeology group and the York Archaeological Trust and urged cooperation. Quite soon we were working together. The University offered the Trust laboratory facilities and access to otherwise unavailable equipment while the Trust provided an unending supply of rich, varied, well-documented and freshly-excavated material, and a host of research problems. Arnold was soon applying neutron activation analysis to the characterisation of Roman and medieval ceramics from York, building on his existing work on the medieval kiln products of Yorkshire and Lincolnshire. I seem to remember that we at least showed that the Torksey wares from Anglo-Scandinavia York were unlikely to have come from Torksey, or at least from those Torksey kilns whose products Arnold had sampled. Equally we were struck by the similarities between Roman wares known to have been made in York and medieval wares also made in York. Clearly this kind of cooperation had huge potential, the York material providing endless research fields.

The most valuable commodity the Trust could trade, however, proved to be its personnel and their expertise. The Bradford archaeological sciences group was devising a postgraduate course in the Postgraduate School of Physics entitled Scientific Methods in Archaeology designed to acquaint archaeology graduates, mainly with little scientific background, with the basics of archaeological science. Trust staff, with their extensive archaeological experience and range, were able to help broaden the curriculum and provide general archaeology teaching while our Head of Conservation, Jim Spriggs, offered teaching in archaeological conservation. I felt a huge pang of sympathy for Arnold's mission to convert scientifically-illiterate archaeology students, the sort of tyro I must have been when he first met me, into persons who were at least capable of comprehending the limitations of science in archaeology. In the event over 50 such students emerged from Bradford with the postgraduate qualification by 1991, many going on to influential careers.

The new course managed to attract UGC funding and a reasonable take-up, producing its first Postgraduate Diplomas and Master's degrees in Archaeological Science in 1975. For select Trust staff the arrangement meant a regular 'Bradford Day' (Mondays) on which the week's archaeology problems were run through the Bradford laboratories, and lectures, tutorials and work assignments and assessments were given to the post grads. Our friendships developed with Arnold, then Head of Archaeological Sciences, and colleagues like Stanley Warren and, *eminence grise* in the background, Professor Gordon Brown, and our eyes were constantly being opened to possible new avenues for investigation as we developed the urban research programme at York.

One important contribution to the work of the York Archaeological Trust came simply from the presence of an X-ray unit at Bradford. Each week, Jim Spriggs reminds me, we came over with plastic Spriggs Tubs (ingenious rigid sealed containers with silica gel in a column up the middle) full of ironwork for radiography. The x-ray unit was housed in the Van de Graaf generator room, full of nasty-looking electronics that hummed and

glowed like a set for Dr Who. Jim had to go in with a geiger counter which by experiment he found would stop emitting its crackle if you kept very close to the outer walls. Archaeological Science was, of course, shoe-horned into Nuclear Physics and many of the labs we had to go through were pretty scary places, oscilloscopes everywhere, the odd very early computer terminal and numerous dodgy-looking radioactive sources in various states of exposure. We never knew what was part of Archaeological Science and what was something entirely different, and the researchers, though friendly enough, spoke a language that was barely understandable.

The contacts we made at Bradford, when we understood the language, often proved enormously stimulating and even practically useful. Jim Spriggs, for example, was introduced to one of the research team in the Biology Department, with which Archaeological Sciences early made common cause. That Department turned out to have a small freeze-dryer and Jim persuaded them to put through it some of the waterlogged wood and leather that was beginning to pour out of the anaerobic wet deposits of Viking York, probably some of the first British archaeological samples to have been treated by freeze-drying. The success of this work led directly to the development of York's own purpose-designed freeze drying facility, and Jim's pre-eminence in that field.

If York visits to Bradford stick in our memory, so do Bradford visits to York. Arnold and his colleagues were, of course, regular visitors and did their best to keep abreast of the huge number of excavations undertaken in the 1970s. The main Bradford presence, however, were the MA students who came over for 5-day structured practical sessions in the York Archaeological Trust's original conservation laboratory. At that time the lab was in the medieval basement of the gatehouse to St Mary's Abbey. A location more cramped and inappropriate for teaching six students at a time would be hard to imagine. Heaven knows what the modern health and safety at work legislation would have made of it. The victims, however, seemed to enjoy the experience and some still occasionally reminisce about the fun and interest of handling the wonderful freshly-excavated collections we were dealing with in the 1970's. To give the students an occasional breather we would equip them with clipboards and send them round the galleries of the nearby Yorkshire Museum to see how many conservation horrors they could spot in the galleries and to write critiques of the display conditions and techniques. This may well have contributed to the rapid cooling of relations we experienced with staff in that redoubtable institution.

As Archaeological Sciences at Bradford gradually developed so did the recognition that there was a growing national need for archaeological science. It seemed an especially urgent need as rescue archaeology burgeoned in the 1970s. In due course the case was made through the Science Research Council and the British Academy for the establishment of a Science-based Archaeology Committee (SBAC), which eventually came into being in 1976. Gordon Brown was inevitably one of the SRC protagonists and my old Belfast Professor Martyn Jope, a bio-scientist turned archaeologist who had developed the Radiocarbon dating laboratory at Belfast, was inevitably the British Academy's front man. Gordon and Martyn hit it off, devised a scheme for the rapid development of archaeological sciences at Bradford, quietly engineered funding through

the national committees, and set up the School of Archaeological Sciences. I suddenly found myself appointed an Honorary Visiting Reader. Equally suddenly I found myself working once again with my old boss Martyn, now made an Honorary Visiting Professor.

The context for this was, of course, the next stage in Bradford's development as a centre for archaeological science. The introduction of an undergraduate course in Archaeological Science in 1975, following the evident success of the postgraduate diploma and Master's degree, meant that there were far more heavy demands for systematic teaching of archaeology and for development work on the curriculum. The University therefore appointed Dr Norman Hammond and Dr John Hunter who gradually replaced the functions of the York archaeologists and established a tradition of fieldwork in various parts of Europe and elsewhere which broadened the horizons of Bradford students while providing new avenues for departmental research. York continued to welcome a constant stream of placement students for their in-course experience, one of the most valuable characteristics of the Bradford undergraduate degree which the Trust found mutually beneficial, but our general involvement began to decline.

Arnold and his team at Bradford displayed considerable skill in mobilising the help of part-time specialists both within the University and outside, extending the range of disciplines and expertise to which the students would be exposed. The local medic Dr Keith Manchester, with his largely self-taught expertise in palaeopathology, was one of these. He laid the foundation for what was soon recognised as one of the few UK university bases for the archaeological study of human bone. This *was* an area for further fruitful contact between Bradford and the York Archaeological Trust. In those days it was remarkably difficult to lay hands on well excavated and documented human skeletal material from archaeological contexts. On the one hand human burials were traditionally the sphere of the Home Office, the Church of England or the police; on the other most archaeologists saw no point in excavating cemeteries of post-Anglo-Saxon burials, then considered impossible to date and incapable of producing useful information about anything.

Years before at Cambridge I had gone to a few seminars given by an enthusiastic young research fellow Don Brothwell who had intrigued me by his explanations of what could be learned from a human skeleton and interested me by his complaints that there were so few groups of them available for study from the later periods. I included in the research aims for the York project right back in 1972, therefore, the excavation of representative samples of York's population from Roman times until post-medieval times, notionally 200 burials per century, which I was assured would be a reasonable sample. By the mid-1970s I had managed to persuade my very dubious board of trustees at York, our hesitant funders at the Department of the Environment and doubtful archaeological colleagues at York to excavate several small series of medieval burials and the vast cemetery of one poor city centre medieval parish. These were later to be joined by others including most of York's medieval Jewish cemetery.

Here was the resource that Bradford needed, and once again the value of the close contact between the Trust and the University became apparent. I found it mildly frustrating that

Keith was single-mindedly interested in palaeopathology, whereas I wanted to know about more general aspects of the populations we were excavating - but the cooperation was a fruitful one, another demonstration of the wisdom of Arnold's careful nurturing of the world outside the University.

The laboratory went on to great things, incorporating the Calvin Wells Collection, developing international cooperation with the likes of Professor Don Ortner and establishing its current global reputation. Throughout, however, the strong contacts with the Trust have continued. One of the laboratory's present stars Dr Christopher Knussell, for example, worked with us at the very start of his career, and continues from time to time to make his own distinctive contributions to the York research output. Charlotte Roberts and others in their time have all made the much appreciated contributions in the York direction.

That, however, is largely a story of the later years of Bradford's success under Arnold's custodianship. I was only offered the indulgence today, and the privilege on Arnold's special day - of reminiscing about early days, and then only about Bradford and York.

It's a bit of an incomplete story because my friendship with Arnold has continued to the present - often in meetings of the Council for British Archaeology, of which he is a strong supporter, and the Yorkshire Archaeological Society, or in the context of conversations with mutual acquaintances. I leave you with a picture from one of them, Donald Haigh whose Bradford Grammar School ex-pupils still, he tells me, remember the spectacle of Arnold, ever willing to go the extra mile, demonstrating to them the principles of geophysical surveying around the Headmaster's House on school open days. That's their indelible image. I am quite sure each of us has one of his own - or her own - of this most amiable and helpful and influential and exceptional man.